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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/597,844	07/10/2007	Anatoliy Kosterev	1789-13902	7007
23505	7590	11/12/2009	EXAMINER	
CONLEY ROSE, P.C. David A. Rose P. O. BOX 3267 HOUSTON, TX 77253-3267			SHABMAN, MARK A	
			ART UNIT	PAPER NUMBER
			2856	
			NOTIFICATION DATE	DELIVERY MODE
			11/12/2009	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

pathou@conleyrose.com

Office Action Summary	Application No. 10/597,844	Applicant(s) KOSTEREV, ANATOLIY	
	Examiner MARK SHABMAN	Art Unit 2856	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 July 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 09 August 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>8/9/2006</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Objections

Claims 14-20 are objected to because of the following informalities:

Claim 14 is an apparatus claim, however line 2 states "the method comprising". This should be changed to --the apparatus comprising-- to avoid confusion.

Claims 15-20 which depend on apparatus claim 14 all being with "The method of claim 14" rather than --the apparatus of claim 14--.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Hammerlich US Patent 5,159,411 (hereinafter referred to as Hammerich).

Regarding **claim 1**, Hammerich discloses a method for detection of a gas using photoacoustic spectroscopy comprising the steps of providing a light source 10 to introduce an optical signal with at least one wavelength into a fluid sample 20, modulating the optical signal via pulse trigger 70 to change the frequency and generate an acoustic signal, measuring the acoustic signal with a

transducer 30, and using the phase of the acoustic signal to detect the presence of a target fluid.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 2-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hammerich.

Regarding **claim 2**, Hammerich would use a modulation frequency greater than the relaxation rate in order to ensure that an acoustic signal is generated. Any frequency less than the relaxation rate would fail to produce the acoustic signal.

Regarding **claim 3**, figure 2 of Hammerich discusses the phase change as a vector with a phase orientation angle and it therefore would have been obvious to one of ordinary skill in the art at the time of invention to have performed a rotation transformation as calimed.

Regarding **claim 4**, it would have been obvious to one of ordinary skill in the art at the time of invention to have used an optimum phase rotation angle in order to ensure proper and accurate results.

Regarding **claim 5**, the method of Hammerich includes a rotation of the phase of the acoustic signal as a means to suppress the contributions of the first fluid (A).

Regarding **claim 6**, the vectors of figure 2 represent the instrument phase lag and thus the rotation would be equal to it.

Regarding **claim 7**, the rotation of the vectors as previously stated can be interpreted as an adjustable reference frame as claimed.

Regarding **claim 8**, the value of the adjustable reference frame would have to be pre-determined at a point in time for calculations.

Regarding **claim 9**, Hammerich discloses using an in-phase signal and a quadrature phase signal as claimed.

Regarding **claim 10**, the amplifier of Hammerich has an adjustable phase as claimed and functions as a receiver.

Regarding **claim 11**, Hammerich uses an optical signal that causes the target fluid to become excited and resonate at that wavelength as claimed.

Regarding **claim 12**, the Hammerich reference does not explicitly disclose using a modulation frequency greater than 30 kHz, however, one of ordinary skill in the art at the time of invention would have used any frequency needed depending on the gas which is to be detected to generate the resonance for detection by the detector.

Regarding **claim 13**, it would have been obvious to one of ordinary skill in the art at the time of invention to have optimized the difference in the phase lag by optimizing the modulation frequency to minimize any type of lag.

Regarding **claim 14**, Hammerich discloses an apparatus comprising a light source 10 to introduce an optical signal with at least one wavelength into a fluid sample 20 wherein the signal is modulated via pulse trigger 70 to change the frequency and generate an acoustic signal with a phase shift, an acoustic detector 30 for detecting the signal in at least two phases which would produce at least two output signals, and a microprocessor 50 for using the phase of the acoustic signal to detect the presence of a target fluid.

Regarding **claim 15**, Hammerich would use a modulation frequency greater than the relaxation rate in order to ensure that an acoustic signal is generated. Any frequency less than the relaxation rate would fail to produce the acoustic signal.

Regarding **claim 16**, figure 2 of Hammerich discusses the phase change as a vector with a phase orientation angle and it therefore would have been obvious to one of ordinary skill in the art at the time of invention to have performed a rotation transformation as calimed.

Regarding **claim 17**, it would have been obvious to one of ordinary skill in the art at the time of invention to have used an optimum phase rotation angle in order to ensure proper and accurate results.

Regarding **claim 18**, the rotation of the vectors as previously stated can be interpreted as an adjustable reference frame as claimed.

Regarding **claim 19**, in order for an acoustic signal to be generated, the wavelength of the optical signal would be selected accordingly.

Regarding **claim 20**, Hammerich would use a modulation frequency greater than the relaxation rate in order to ensure that an acoustic signal is generated. Any frequency less than the relaxation rate would fail to produce the acoustic signal. As the relaxation rate is the inverse of the relaxation time, the modulation frequency would be greater than the rate as claimed.

Regarding **claim 21**, the Hammerich reference does not explicitly disclose using a modulation frequency greater than 30 kHz, however, one of ordinary skill in the art at the time of invention would have used any frequency needed depending on the gas which is to be detected to generate the resonance for detection by the detector.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MARK SHABMAN whose telephone number is (571)270-3263. The examiner can normally be reached on M-F 8:00am - 4:30pm, EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hezron Williams can be reached on (571) 272-2208. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Hezron Williams/
Supervisory Patent Examiner, Art
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/M. S./
Examiner, Art Unit 2856